In the United States Patent and Trademark Office

Application No.: Not yet assigned	)	Filing Date: MARCH 29, 2004
Title: TURBOCHARGER WITH HYDRODYNAMIC FOIL BEARINGS	)	
Applicants: LARUE ET AL..	)	Attorney Docket No.: H0006214
Examiner: Not yet assigned	)	Art Unit: Not yet assigned

Petition to Make Special Under 37 C.F.R. 1.102(c)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner,

This petition is filed pursuant to 37 C.F.R. 1.102(c) concurrently with the above referenced patent application as an invention that will materially enhance the quality of the environment and materially contribute to the conservation of energy resources.

The present invention is directed to use in turbochargers. For diesel engines, turbochargers are essential for fuel economy and low emissions. Turbocharged diesel engines are about 20-30% better in fuel economy and 50-80% cleaner in particulate emissions than non-turbocharger diesel engines. NOx emissions in turbocharged engines

Certification under 37 C.F.R. §1.10
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By: _____
STACY N WILSON

are reduced 50-80% through the use of charge air cooling and exhaust gas recirculation systems.

Similarly for gasoline engines, turbochargers enable engine downsizing and improve fuel economy by 10%. Turbochargers supply more air and better control that air supply than non-turbocharged engines. A controlled supply of air enables the shaping of the torque curve and makes the engine supply the torque of a large engine with the fuel economy of a small engine.

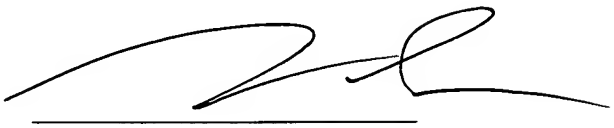
Turbochargers today rely on oil lubrication. The durability of an oil-lubricated turbocharger is highly dependent on the engine lubrication system. The now common use of low-viscosity oils and high engine oil temperatures to reduce friction adversely affects the stability and durability of the turbocharger bearing system, as well as the effectiveness of the oil seals. On the other hand, operation under very cold conditions can lead to a delay of the oil pressure reaching the turbocharger and can also result in turbo bearing durability problems. Additionally, oil-lubricated turbochargers are restricted to being used in a particular horizontal orientation, since they depend on gravity for draining the oil from the bearings. As a result, the engine or vehicle designer does not have much freedom with respect to placement of the turbocharger. These and other drawbacks of oil-lubricated turbochargers have led industry to seek to develop a practical turbocharger employing hydrodynamic air foil bearings.

However, prior to the present invention, it is believed no production turbochargers incorporating foil bearings have been developed, at least in part because difficulties have been encountered in adequately cooling the foil bearings. Without adequate cooling, foil bearings tend to have short useful lives. Thus, significant technical challenges have to be overcome to develop a practical design. These challenges include developing an adequate bearing housing thermal design and cooling system to avoid overheating the foil coatings, providing adequate seals to prevent bearing contamination by engine oil and combustion products, and developing a high stiffness shaft design to avoid shaft instability at high speeds.

The present invention addresses the above needs and achieves other advantages as well, thus further improving the emissions reduction and fuel conservation enhancements

provided by turbochargers generally. For these reasons, applicant respectfully petitions that this application be made special for advancement of examination.

Respectfully submitted,



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